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Artificial Intelligence Based Traffic Management System.

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Abstract: *One of the basic necessities which we consider to live in a neighbourhood is how the people commute.Roads are the basic means of commutation in any country.Due to the increasing population and the growing economies,the number of vehicles purchased and driven has increased manifolds.The result of this drastic increase is traffic jams in metropolitans.The two major reasons behind these traffic jams is CONGESTION and CONTENTION between the vehicles.Due to these circumstances,there is a considerable loss of time leading to growing frustration indemned in the people especially the working class which eventually leads to accidents and breaking traffic laws. The proposed system works on the images captured by the traffic cameras and processed by the DSP processor.*

Keywords-*artificial intelligence,machine learning,digital image processing,traffic management*

I. Introduction

For effective traffic management digital image processing is used to control traffic jams on roads.This system monitors the traffic and identifies the density of vehicles on the road..

The system process the geographical parameters of the roads i.e the wide,longitudinal distance between the junctions.The process involves monitoring the traffic in real time,extracting data and analysing the scenario with respect to time .By this technology we can analyse the issues leading to traffic jams .Appropriate actions can be taken place based on the analysis of the system.

.The current management of traffic is done by traffic signals installed on crowded junctions and through services delivered by the traffic police.Due to the static programs setup in the traffic signal's control systems,it is difficult to manage the traffic effectively.Because of lack of technology implemented in managing the traffic there is a considerable loss of fuel and time and an increase in the rate of accidents taking place.In order to to overcome the issues regarding traffic jams,intelligent systems have to be setup which can monitor,analyse and deliver actions with respect to the current traffic condition,

II. Literature Survey

The idea of using digital monitoring is not a new concept. It has been used at numerous sites worldwide. Various technological advancements have been proposed in several citations.

Logi and Ritchie [23] investigate the interjurisdictional traffic congestion management on freeway and surface street (arterial) networks. Their system is composed of two interacting realtime decision support agents, i.e., a freeway agent and an arterial agent, for analysis of congestion and for generation of suitable responses. The freeway agent supports incident management operations for a freeway subnetwork, and the arterial agent supports operation for the adjacent arterial network. Both agents continuously receive real-time traffic data, incidentdetection data, and control status of the control devices on the network (signals, ramp meters, and changeable message signs). By performing an analysis of the input data and interacting with a human operator at their local traffic operation center (TOC), each agent generates suitable local control plans, which are aimed at reducing the impact of congestion at a local level. The system provides a dialog facility through a distributed user interface to allow operators at different TOCs to agree on the selection of a global solution. Van Katwijk and Van Koningsbruggen [24] propose an agent-based approach for the cooperation of traffic-control and management instruments. To improve traffic flow and provide safe and secure transport of people and goods, increasingly more traffic control and management instruments are installed on highways. The increasing number of deployed instruments sometimes causes conflicts when control tools are applied in the same area. By modeling individual instruments as intelligent agents, the cooperation of traffic control and management instruments can be achieved by the cooperation of distributed agents in a multiagent platform. Weyns et al. [25] present an agent-based anticipatory vehicle routing approach to avoid traffic congestion. The individual vehicles are able to dispatch lightweight agents for exploring alternate routes and inform the road infrastructure about its travel intention. Rothkrantz [26] reports a distributed routing model of a personal intelligent traveling-assistant system. The JADE agent platform is adopted in the system. Personal agents for each individual traveler

communicate with the driver and the system to provide optimal advice to the traveler and update stored traffic information in the system.@http://www.imes.mtu.edu/PubDocs/ITS-review.pdf@

III. Proposed Methodology

.Traffic management is one of the most growing concerns among the metropolitans.The amount of pollutions taking place because of traffic jams has serious consequences on global warming and health deterioration of the people and animals Wireless network enables low-cost transmission of image data having low equipment cost, low installation cost, low maintenance cost, low duty cycle, low power consumption.

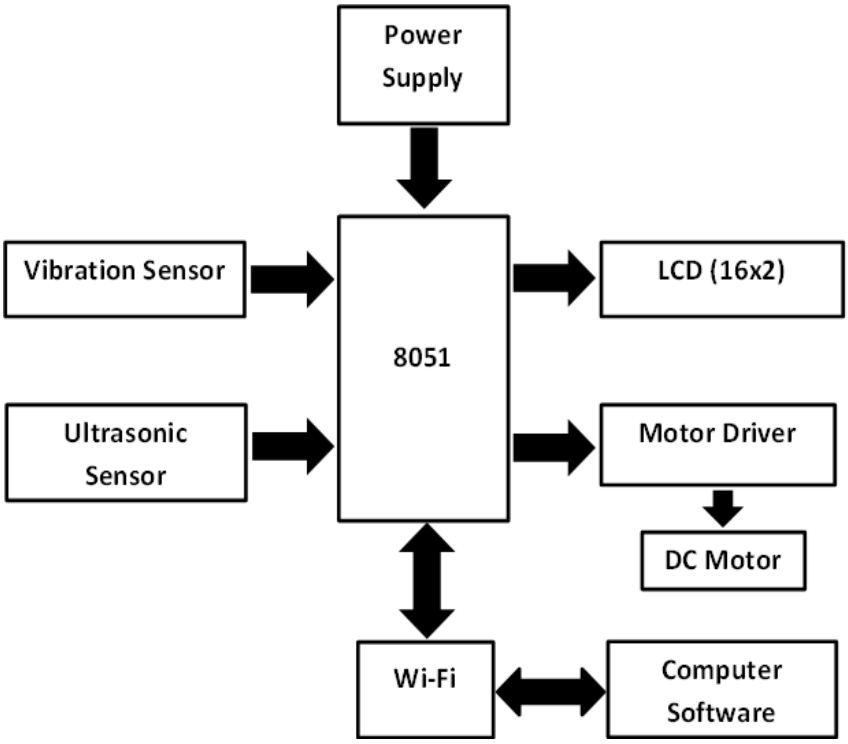

Fig.2 Block Diagram of SHM

The systems comprises of aal the given devices for monitoring,analysing and controlling all the actions.

1.Traffic signals are used to govern the flow of traffic signals which is controlled by the traffic police.Vehicles and pedestrains have to follow the traffic signal rules and commute accordingly.

2.High definition night vision cameras are used to capture the real time images i.e digital data which is to be analysed.These cameras should be environmentally safe to be installed on traffic signal posts.

3.Digital video recorder (dvr) which has power supply embedded in it to store the digital data.The DVR should be capable enough to store the required amount of data and shouln't be bulky as it has to be installed on the traffic signal post..

4.IP network to transmit data to the monitoring center.The network should be efficient enough to transmit n recieve signals simultaneously in real time..

5.Digital signal processor to process the image data and provide information based on the image data.It should be a high specification processor capable to process images in real time.

6.Cluster of nodes to analyse the data and transmit the signal back to the traffic signal post.The analysis of the cluster will provide the information regarding the actions to be taken place by the traffic signal.The analysis is done by implementing distributed computing by the cluster of nodes..

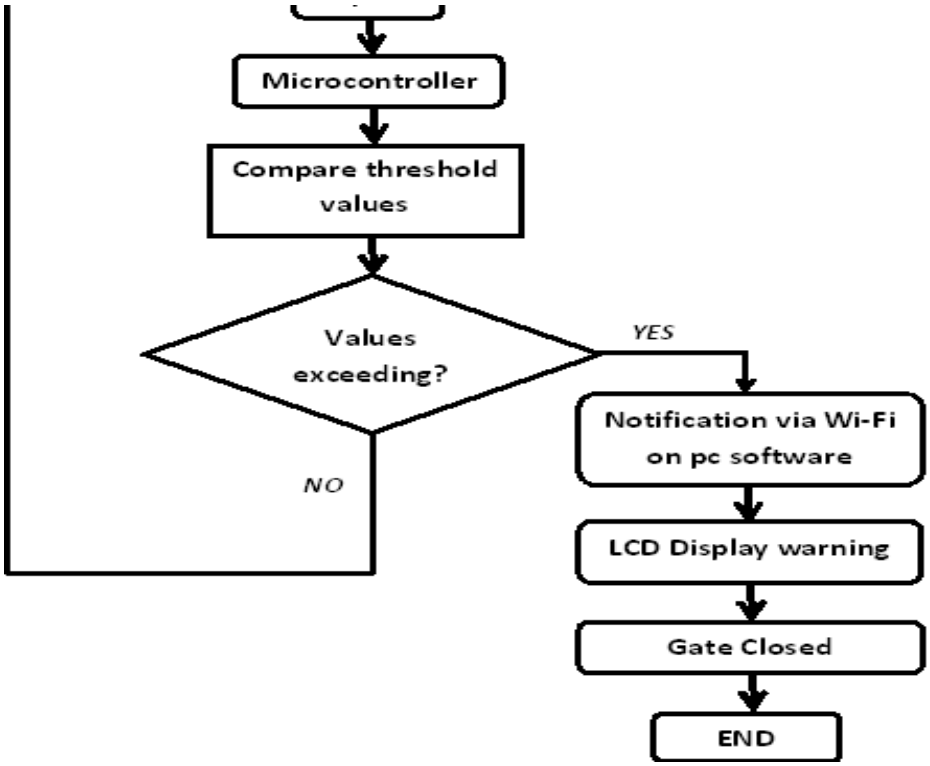

Fig.3 SHM Flowchart

IV. Expected Results

In this system, Digital image processing is used to process the image data and analyse the geoghraphical condition of the roads i,e the wide, the lenght of the traffic jam,the traffic density.By analysing the data the system generates insights on how to manage the traffic by controlling the light of the traffic signal.

V. Conclusion

The effective management of the traffic flow on the road will greatly influence the current rate of rising global warming,fuel consumption and will eventually lead to a pollution free environment.This has a magnanimous influence on the peoples mind and the economy of the country as well.

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